Third United Nations International Conference on the Peaceful Uses of Atomic Energy

A/CONF.28/A/66
FRANCE
February 1964
Original: FRENCH

Confidential until official release during Conference

Abstract

THE REPROCESSING OF IRRADIATED FUELS BY HALIDES AND THEIR COMPOUNDS

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A brief description is given of the experiments leading to the choice of the process : volatilization of fluorides by gas phase attack.

The chemical process is described for certain current types of clad fuels : the aluminium or the zirconium cladding is first volatilized as chloride by attack with gaseous hydrogen chloride. The uranium is then transformed into volatile hexafluoride by attack with fluorine. These reactions are carried out consecutively in the same reactor in the presence of a fluidized bed of alumina which facilitates heat exchange.

The experiments have been carried out in quantities from 100 gms to several kilograms of fuel, first without activity, and then with tracers.

A description is given of the laboratory research which was carried out simultaneously on the separation of uranium and plutonium fluorides.

Finally, an apparatus is described which is intended to test the process on irradiated fuel at an activity level of several thousands of curies of fission products.

Translation provided by courtesy of the submitting Government